MODULATION OF THE GROOMING BEHAVIOR INDUCED BY THE UREASE OF CANAVAIIA ENSIFORMIS (JBU) IN NAUPHOETA CINEREA COACKROCHES

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Jack Bean Urease (JBU) is a natural insecticide. We have investigated the central nervous system activity of JBU in Nauphoeta cinerea cockroaches. N. cinerea of both sexes, were reared at 23-26°C, with water and dog chow ad libitum. Grooming activity was measured as described by Sturmer et al., 2014. Data were plotted as the mean ± S.E.M of the total number of leg and antenna grooming in s/30min. Treatments (10µl) were administered at the animal third abdominal segment, with a Hamilton syringe. Significances were taken at p<0.05, by the Student “t” test. In control parameters the values of grooming were 150 ± 5s/ 30min for the legs and 70 ± 8s/ 30min for antennas (n = 30), respectively. When JBU (1.5, 3 and 6 µg/g of animal) was administered, there was a dose-dependent alteration in the grooming activity. Thus, at 1.5 µg/g of animal weight JBU, there was no significative change in the grooming activity for antenna 50 ± 6s/30min and 178 ± 9s/30min of leg (n = 30, p> 0.05, respectively). When 3 µg/g JBU was administered, there was an increase in the grooming activity to 253 ± 30s for the legs (p <0.05), without changing the antenna’s behavior (57± 7s/30min, p>0.05), n=30 respectively. At 6 µg/g JBU, there was a further increase in the leg grooming activity to 364 ± 23s/30min (p <0.05), with no significative change in the antenna counterpart (80 ± 9s/30min), n=30 respectively. The previous treatment of the animals with phentolamine (5µM) prevented significantly the increase of leg grooming activity observed for 6 µg/g JBU (55± 9s/30min, n=28, p<0.05). The entomotoxic activity of Jack Bean Urease involves profound alterations in insect behavior. The increase of leg grooming activity by JBU, together with its inhibition by phentolamine, suggests an octopamine-related mechanism by the urease entomotoxic activity.

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